



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/585,192	06/01/2000	Charles L. Zahm	GEH-01-060	4926
7590 02/26/2008				
John S Beulick Armstrong Teasdale LLP Suite 2600 One Metropolitan Square St Louis, MO 63102			EXAMINER BROADHEAD, BRIAN J	
			ART UNIT 3664	PAPER NUMBER
			MAIL DATE 02/26/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/585,192

Applicant(s)

ZAHM ET AL.

Examiner

Brian J. Broadhead

Art Unit

3664

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-15 and 17-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-15 and 17-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 5-9, 12-15, 19-23, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bidaud, 6347265, in view of Ford, 6211821, in further view of Gross et al., 6218961.
3. Bidaud discloses determining at least one of motion and location parameters of a locomotive including pitch, yaw (heading), and a rate of yaw (curvature) on lines 22-55, on column 3; determining track curvature on lines 19-30, on column 5; the track curvature is determined from angular rotation and velocity on lines 20-30, on column 5; angular rotation is found from a gyro and vehicle speed from a tachometer on lines 20-30, on column 5; determining position of the locomotive on line 7, on column 5; accessing a track database of heading and grade on lines 1-126, on column 6; sampling latitude and longitude from satellite receivers and determining distance traveled by the locomotive on lines 7-12, on column 5; and using the formula for distance traveled or its equivalent and adding the sampled distances is inherent in Bidaud.
4. Bidaud does not disclose providing at least two satellite signal receivers on the locomotive at spaced locations along the length of the locomotive; determining a set of phase differences between satellite reference signals received by satellite receivers;

and determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive and based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel; determining a vector difference between two antennas mounted to the locomotive; and determining an attitude rate; and the integer ambiguity is resolved by consulting a database that provides an initial heading and track grade as a function of latitude and longitude.

5. Ford teaches providing at least two satellite signal receivers on the vehicle at spaced locations along the length of the vehicle in figure 4; determining a set of phase differences between satellite reference signals received by satellite receivers on lines 43-50, on column 2; and determining an accurate heading of the vehicle during normal vehicle transit operation using the set of phase differences between the satellite reference signals, wherein the vehicle is self-propelled, wherein the heading is aligned with the direction of travel of the vehicle and based on whether the vehicle is oriented in a cab forward or cab reverse orientation of travel on lines 10-44, on column 33; and determining a vector difference between two antennas mounted to the vehicle on line 26, on column 3. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teaching of Ford in the invention of Bidaud because such modification would provide a low cost and reliable alternative to a gyrocompass pair as stated by Ford on line 45, on column 1.

6. Ford and Bidaud do not disclose the integer ambiguity is resolved by consulting a database that provides an initial heading and track grade as a function of latitude and longitude. Ford does disclose using a database of constraints including heading and grade(pitch) to limit ambiguity on column 4. Gross et al. teach consulting a track database that provides track information as a function of latitude and longitude and that this information is used to limit measurement errors on lines 65-67, on column 4. It would have been obvious to one of ordinary skill in the art to use the track database of Gross et al. in the invention of Ford and Bidaud because such modification would provide more accurate constraints. In Ford, the constraint database is only rough ranges, by using the track database of Gross et al., the measurement errors can be decreased and the constraints will be much more accurate than simple ranges.
7. Ford, Bidaud, and Gross et al. do not disclose determining an attitude rate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use calculate and attitude rate once the attitude was already determined because it is instantly obvious and a design choice.
8. Claims 3, 4, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bidaud, 6347265, in view of Ford, 6211821, in view of Gross et al., 6218961 as applied to claims 1, 2, 15, and 16 above, and further in view of Wilson, 6313788.
9. Bidaud, Gross et al., and Ford disclose the limitations as set forth above. They do not explicitly disclose determining d using the equation in the claims. Wilson discloses using the equations in the claims to determine d on line 15, on column 9. It

would have been obvious to one of ordinary skill in the art at the time the invention was made to use the equations of Wilson in the invention of Bidaud, Gross et al. and Ford because such modification provides a mathematical way to determine d , or as more commonly known, the baseline vector.

10. Claims 10, 11, 24, 25, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bidaud, 6347265, in view of Ford, 6211821, in view of Gross et al., 6218961, as applied to claims 1, 5, 15, and 19 above, and further in view of Kumar, 5896947.

11. Bidaud, Ford, and Gross et al. disclose the limitations as set forth above. They do not disclose dispensing a track lubricant in accordance with the determined curvature and when the curvature exceeds a predetermined magnitude, or based on the curvature value contained in a track database. Kumar discloses dispensing a track lubricant in accordance with the determined curvature and when the curvature exceeds a predetermined magnitude on columns 1 and 2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the curvature calculated by the invention of Bidaud, Ford, Gross et al. to dispense the lubricant of Kumar because such modification would provide a source of the curvature value for Kumar. Kumar is silent as to how the curvature value is determined. Bidaud, Ford, and Gross et al. provide a way to determine curvature through GPS calculations, gyros, or track databases.

Response to Arguments

12. Applicant's arguments filed 10-25-07 have been fully considered but they are not persuasive. With respect to the arguments involving the rejection based on Bidaud, Ford, and Gross, applicant's argument are not convincing because what Ford teaches has been misconstrued. Ford does not teach only correcting a bias of a magnetic compass based on the heading sensor. This one teaching is only for when satellite signals are poor. The cusp of the invention of Ford is using phase differences to determine the baseline, azimuth, pitch, etc. of the vehicle. Note that the compass isn't even claimed as part of the invention. Hence, the addition of "only" to the claims does not overcome the prior art.

13. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

14. In response to applicant's argument that the art teaches away from the claimed invention, it is noted that applicant provides no evidence to support this position. Instead, applicant argues that the references fail to teach certain limitations. This is not proof of "teaching away". The limitations that applicant asserts are not disclosed are the same limitations addressed above in the arguments.

15. The arguments with respect to claims 3, 4, 17 and 18 are not convincing because they don't argue the current rejection. The arguments address Wilson's use of carrier phase to determine integer ambiguity instead of a database, but Wilson was not cited for this teaching. Gross et al. was cited for providing this teaching.

16. The remaining arguments are all similar or exactly the same to the arguments addressed above and are not convincing for the same reasons.

Conclusion

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Broadhead whose telephone number is (571)272-6957. The examiner can normally be reached on Monday through Thursday or Tuesday through Friday.

Art Unit: 3664

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoi Tran can be reached on 571-272-6919. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-3600.

/Brian J. Broadhead/
Examiner, Art Unit 3664